National Experimentation, Testing, Training, and Technology Conference

A Perspective on Life-Cycle Evaluations

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Principal Deputy Director
Operational Test and Evaluation

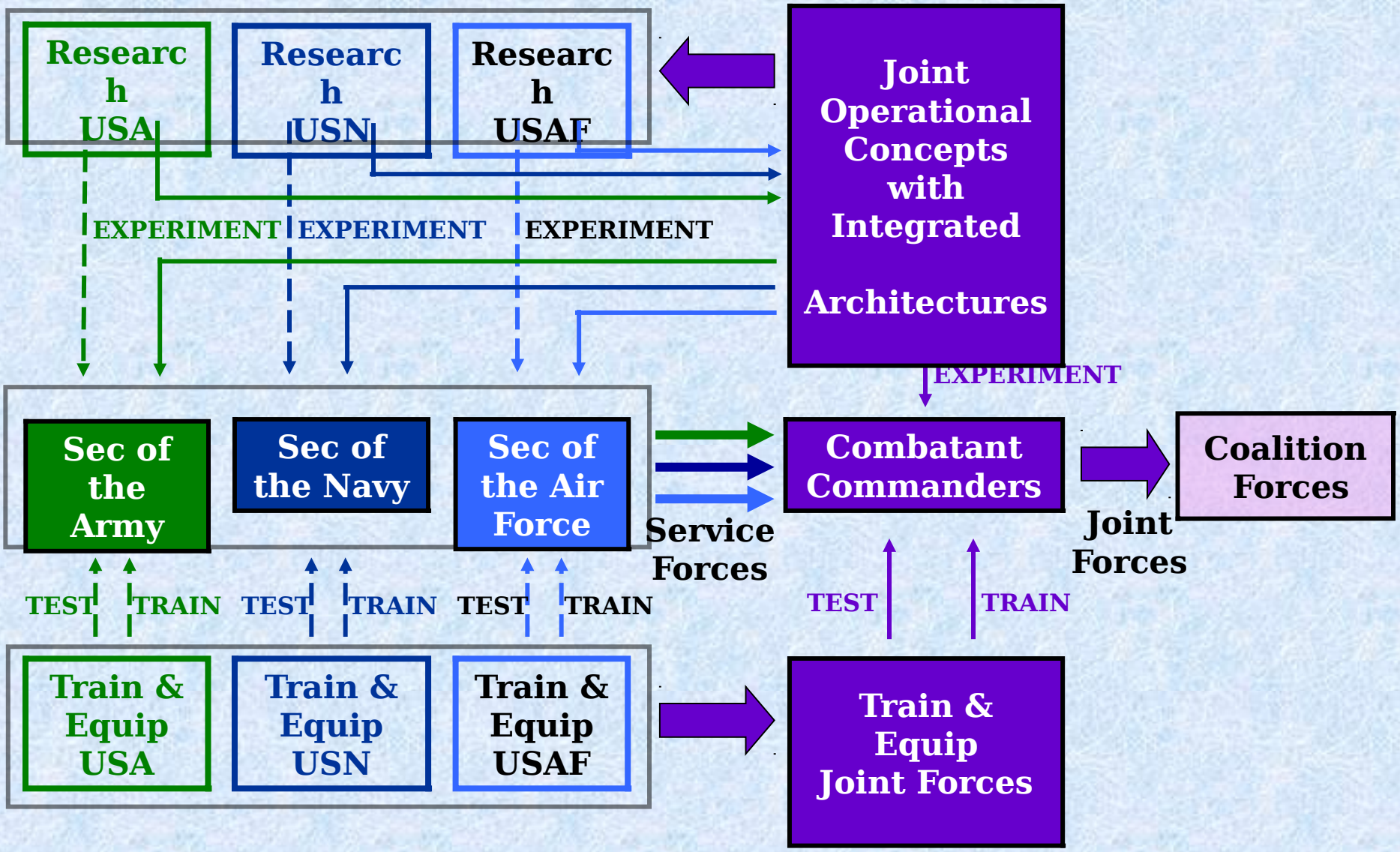
Secretary Rumsfeld on Transformation August 2002

SECDEF's Top Ten Priorities

2. Strengthen Joint Warfighting Capabilities

"**. . . we are requiring that a joint operational concept be fashioned that will then be used to <u>test proposals from the various Services</u> to see to the extent to which they can be rationalized and harmonized to fit within a joint operation concept.**"

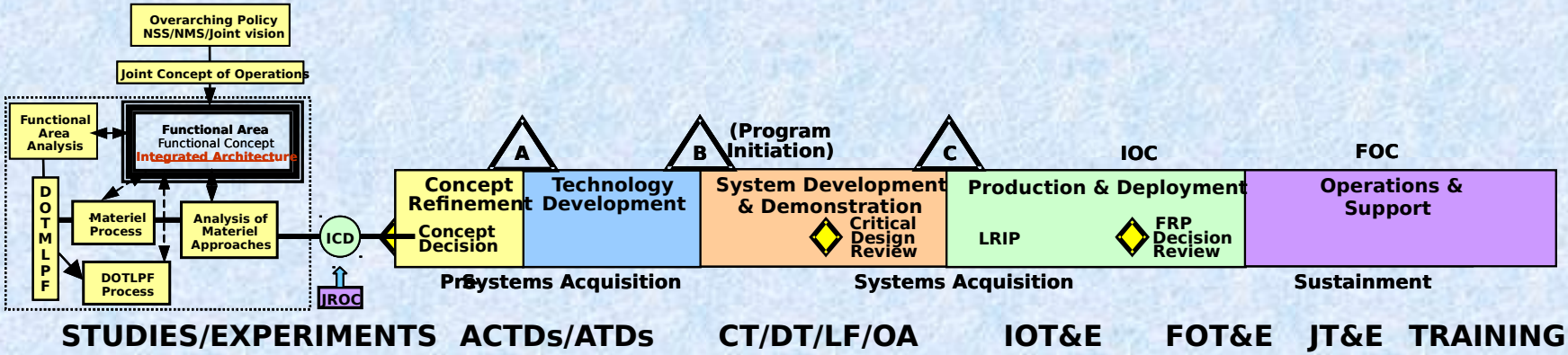
Increased Emphasis On Joint Warfighting Capabilities

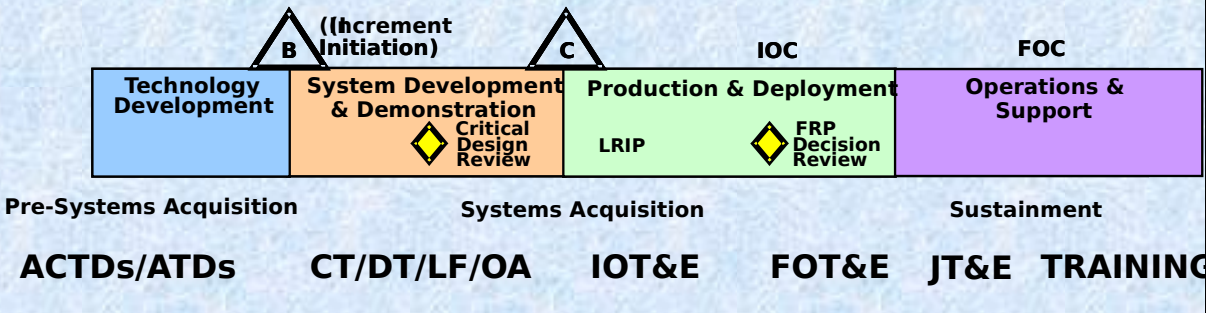


A Life-Cycle Evaluation Continuum

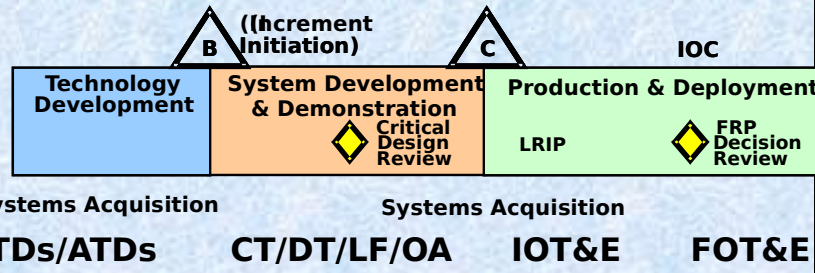
CJCSI/M 3170 / DoDD/I 5000

Concept **Contract** **Combat**





The Tools Are Different
But
The Principles Are the Same



Applying the Scientific Method for Life-Cycle Evaluations

“. . . evaluations should draw upon principles founded in the scientific method and design of experiments. Items such as prediction (hypothesis), planning (test design), data collection (test event), analysis (data verification), and reporting (conclusion) should all contribute to providing the most credible, insightful, and valuable evaluation possible.“

Tom Christie

Essential Elements of an Evaluation Continuum

Four things that will not change as a result of Training Transformation

The need to:

1. **Provide operational realism**
2. **Use smart opposing forces**
3. **Compare to ground truth**
4. **Learn from feedback**

Dr. David Chu
September 2002

An Evaluation Continuum that Provides Operational Realism

- **Evaluate the degree of mission success**
  - **Concepts—DOTMLPF—force structure**
  - **OT&E—DOTMLPF—units w/ new systems**
  - **JNTC—DOTMLPF—units w/ fielded systems**
- **Link realism throughout the life-cycle**
  - **Consider assumptions, limitations, and safety**
  - **Do Missions with operational and tactical tasks**
  - **Use a challenging battlespace environment**
    - **Use clutter and counter measures**

An Evaluation Continuum that Uses Smart Opposing Forces

- **Evaluate w/ an enemy who votes—DOTMLPF**
  - **Is manned and organized realistically**
  - **Is trained and equipped realistically**
  - **Has a mission and means too**
- **Do not unrealistically constrain the enemy**
  - **Rules of engagement permit full range of action**
  - **Encourage innovative and aggressive TTPs**
  - **Use deception and countermeasures**

An Evaluation Continuum that Compares Results to Ground Truth

- **Evaluate against a standard**
  - **Measure current capabilities**
    - **Mission level measures of success**
    - **Instrumentation**
  - **Record current capabilities**
    - **Formal and accessible**
    - **Validated and updated**

- **Measure results for comparison**
  - **Use consistent measures throughout life-cycle**
    - **Concepts, AoAs, ICDs, CDD, CPD**
    - **ACTDs/ATDs, CT/DT/OT, JT&E, JNTC**
  - **Use consistent instrumentation**
    - **Fixed, mobile, non-intrusive (embedded)**

An Evaluation Continuum that Learns from Feedback

- **Evaluate with improvement in mind**
  - **Use what we now know to get better**
  - **Look to the future**
- **Build formal feedback loops**
  - **Use results to refine perceptions**
    - **Refine warfighting concepts**
    - **Adjust capability expectations**
  - **Record results for future use and comparison**
    - **Validate & update demonstrated performance**
    - **Build an accessible performance database**
  - **Adjust measures and methods**
    - **Incorporate new technologies**
    - **Develop new instrumentation**

An Evaluation Continuum that Draws from Strengths

- **So what does the OT&E community offer?**
  - **Mission perspective—Realism**
  - **Measures of success—Rigor**
  - **Instrumentation—Ground truth**
- **Instrumentation**
  - **MRTFB—laboratory and field instrumentation**
  - **CTEIP—new test capabilities**
  - **T&E/S&T—new test technologies**
  - **LFT&T—test & training capabilities**

An Evaluation Continuum that Gets at the Ground Truth

- **Examples of existing NET3 Technologies**
  - **MRTFB**
    - **Threats (FMA & surrogates), TSPI, GPS, telemetry**
    - **Real time casualty assessment (ground-ground)**
  - **CTEIP**
    - **Foundation Initiative 2010—TENA (BIC)**
    - **Advanced Range Telemetry—Half the RF Spectrum**
  - **T&E/S&T**
    - **RF spectrum efficiency**
    - **Hypersonic measurement**
  - **LFT&T**
    - **Virtual Target and Range (VITAR)**

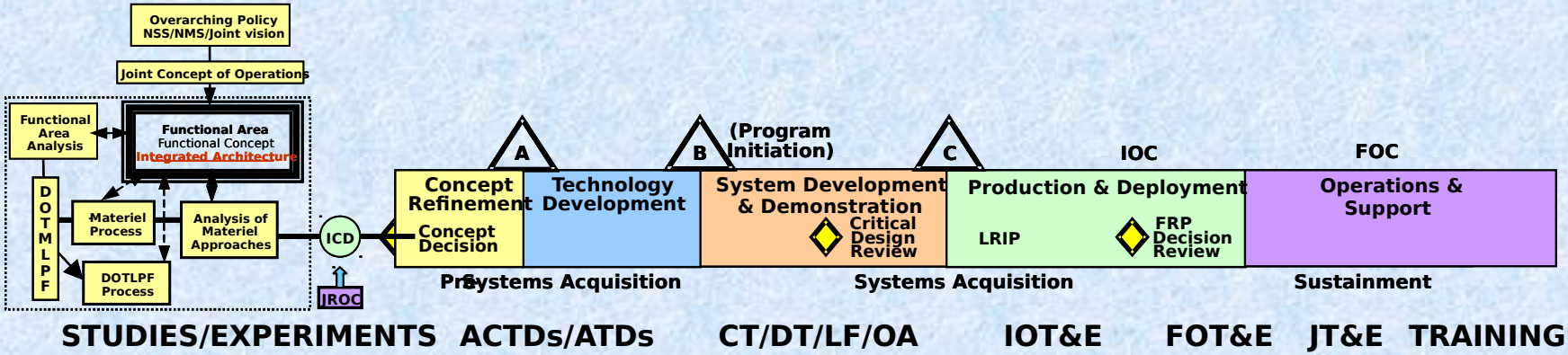
An Evaluation Continuum that Gets at the Ground Truth

- **Examples of needed NET3 technologies**
  - **Non-intrusive instrumentation**
    - **Micro Electrical Mechanical Systems (MEMS)**
    - **Hardened Subminiature Telemetry & Sensor System**
  - **Real time casualty assessment (air-ground)**
  - **Directed Energy methods and measures**
  - **Hypersonic methods and measures**
  - **Comprehensive performance database**
- **An invitation to trainers and experimenters**

A Life-Cycle Evaluation Continuum

Needs a Common Language

Concept — Contract — Combat



It's All About the Warfighter

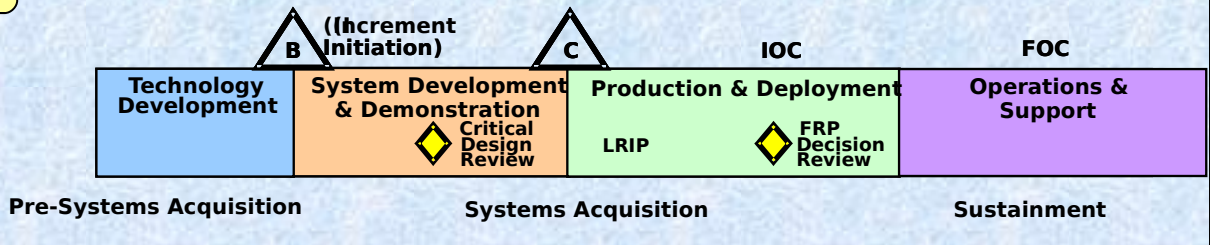
- Train as we fight
- Test as we fight
- Refine how we fight

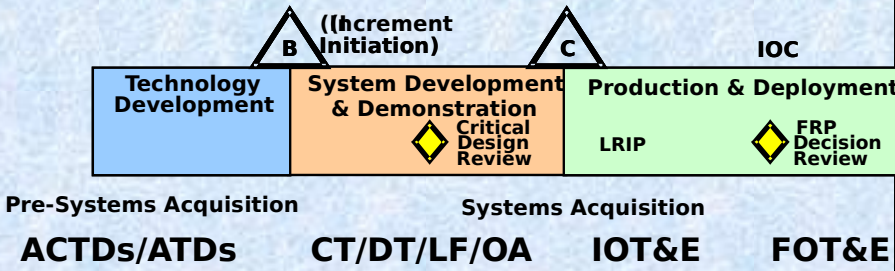
Life-Cycle Communication

- Understand you
- Understand me

Mission Essential Tasks

- UJTL/JMETLs/SMETLs
- Translate to Contract Specs





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Questions?